News Release

Defense Advanced Research Projects Agency

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IMMEDIATE RELEASE July 6, 2006

DARPA ACHIEVES FIRST-EVER AIRBORNE SYNTHETIC APERTURE LADAR IMAGE

The Defense Advanced Research Projects Agency (DARPA) today announced that researchers have, for the first time, produced a synthetic aperture image from an airborne laser radar (also known as "ladar"). Up until this time, only radar has been able to generate a synthetic aperture image. Synthetic apertures use digital signal processing and aircraft motion to generate very high-resolution imagery from relatively small physical apertures.

The achievement is the culmination of the first phase of DARPA's Synthetic Aperture Ladar for Tactical Imaging (SALTI) program, which is aimed at applying radar image collection and processing technology to optical wavelengths.

"Synthetic aperture laser radar technology satisfies the critical need for reliable, long-range battlefield awareness. An image that takes radar tens of seconds to produce can be produced in a few thousandths of a second at optical frequencies," explained Dr. Jennifer Ricklin, DARPA program manager for SALTI. "While radar waves respond to macroscopic features such as corners, edges, and facets, laser waves interact with microscopic surface characteristics, which results in imagery that appears more familiar and is more easily interpreted."

The first airborne synthetic aperture ladar image data was collected at Edwards AFB, Calif., February 17, 2006, by SALTI contractor Raytheon Space and Airborne Systems using fiber lasers developed for the telecommunications industry and employing customized commercial fiber oscillators, amplifiers and detectors. On April 2, 2006, Northrop Grumman Electronic Systems, the other SALTI contractor, independently produced successful images at Edwards AFB, using a design based upon newly developed carbon-dioxide gas lasers. The tests were hosted by DARPA and the Air Force Research Laboratory, who provided a variety of engineering and tactical targets and carefully measured and characterized atmospheric conditions at the time of the data collections.

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